Health Care for the Homeless Network
A Community Project of Public Health—Seattle & King County

December 1, 2004

Dr. Alonzo Plough
Director, Public Health—Seattle & King County
999 Third Avenue, Suite 1200
Seattle, WA 98104

Dear Dr. Plough:

On behalf of the Health Care for the Homeless Network (HCHN) Planning Council and its Quality Management Committee, I would like to offer our perspective on the *2003 King County Homeless Death Review*.

We are deeply disturbed—if not particularly surprised—by the findings. Sadly, they reflect the many and varied risks faced by people struggling to survive on the streets and in the shelters, and they urge us more than ever to work on systems-level solutions to end homelessness. Our fellow King County residents identified in this study died young, at an average age of 47. They suffered a serious burden of illness, averaging three health conditions each. While the ultimate prevention measure is to end homelessness, there are critical steps we should take today to alleviate suffering, prevent premature death, and set the stage for systems change.

First, make strategic increases in outreach and engagement. The decedents include people who had been living outdoors, in cars, in shelters, and in motels. Current outreach programs in our community are extremely limited and narrowly targeted, requiring that a person have a particular diagnosis or have passed through a particular door. Many of the sickest are literally left outside, likely passing through the hospital from time to time as their health continues to erode.

We are particularly concerned about the high percentage of *deaths among Native Americans*, and encourage greater support to address growing homelessness and health issues among urban Native Americans. We are also struck by the apparent lack of access to health care for *those who died outside Seattle*, particularly south King County. Although the numbers of deaths are small, they do suggest that more attention is needed to improve access to care for the homeless people in this region, and this need has been echoed in other community reports.

Second, promote recovery by ensuring that people in homeless shelters, day centers, and housing programs can and do access health care services—including addiction services, mental health care, and medical care. Investments in housing—from short-term shelter to long-term housing—need corresponding investments in health care if people are going to be able to address the underlying causes of and complications from their homelessness. If *recovery* is the goal—be it from medical issues, addiction issues, mental health issues, or more likely a combination of them—then these services must be accessible to the people who need them, when and where they need them. As our homeless response system is fine-tuned to be more effective and systematic in helping people move from the streets into housing, health services and recovery planning must be an integral part of that process. As our

community moves to greater use of the "housing first" model, taking people directly from the streets and placing them in permanent housing, the funding and design of health care services must be integrated into the model.

Third, increase and sharpen strategies to address chronic health conditions such as cardiovascular disease and diabetes among homeless people. Cardiovascular disease was the second highest cause of death among homeless people and the leading cause of death among the sample of formerly homeless people. And regardless of the cause of death, 53% of the decedents had cardiovascular disease. HCHN and its partners in the community need to focus greater attention on preventing and managing chronic health conditions, both among those who are currently homeless and those who have moved into housing. Such work can potentially impact other issues such as substance abuse and depression.

Fourth, increase access to housing and prevent loss of housing: *housing is health care*. People with long-term stable housing enjoy greater health and longer lives than do people who are homeless. Our community needs an adequate supply of affordable housing with appropriate services and sufficient access to affordable healthcare. Safe shelter for people who are currently homeless is essential in the interim. People who are housed need support to help them retain their housing when they face a health care or other crisis.

Fifth, support future homeless death reviews. To continue to guide us, we hope that resources can be identified to conduct future periodic homeless death reviews and address some of questions raised by this review. This initial study can be a benchmark against which we can review changes in homeless mortality over time, but only if additional resources area available to do the work. We also encourage strong ongoing information sharing about homeless deaths among the King County Medical Examiner's Office, Public Health's Health Care for the Homeless Network, and the organizations in our community that know and work with homeless people. The relationships developed through this project have begun to improve this line of communication, and in doing so brought important closure to friends, family, shelter staff, nurses, and others who knew and cared for these King County residents.

The HCHN Planning Council looks forward to following up with homeless people, Public Health—Seattle & King County, the Committee to End Homelessness in King County, the Taking Health Care Home Initiative, and other stakeholders to share the results of this important study so that we can work together to change the conditions that deprive so many of our neighbors of home, health, and—all too often—their lives. Please do not hesitate to contact me if the Planning Council can be of further assistance.

Sincerely,

Linda Weedman

Linda Weedman
Chair, Health Care for the Homeless Network Planning Council

King County 2003
Homeless Death Review

Public Health – Seattle & King County

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We also extend our thanks to the members of the Health Care for the Homeless Planning Council and its Quality Management Committee, who provided overall guidance throughout the process. For more information on this review, contact HCHN at (206) 296-5091.

Particular thanks goes to Margery Muench (project lead), Susan Kline, and Genevieve Rowe for making this report possible.

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Executive Summary

Background

The King County Council included a proviso in its 2004 Public Health budget requiring a review of the nature and causes of death among homeless people in King County. Public Health's Health Care for the Homeless Network (HCHN) led the project, in collaboration with the King County Medical Examiner's Office, the Epidemiology, Planning, and Evaluation Section and others. The overall goal of this review is to develop preliminary information on the number, causes, and characteristics of deaths among people who were identified as homeless and were under the jurisdiction of the King County Medical Examiner in 2003.

Methods

The cases reviewed in this report were those of homeless people who died in 2003 in King County and whose deaths fell under the jurisdiction of the King County Medical Examiner (KCME). All data for this review were from the KCME database, including investigation records and autopsy reports. Potential cases were identified when: (1) The residence address in the KCME records matched that of a known homeless shelter, day service center, or transitional program; or (2) the residence field in the KCME database was listed as "no permanent address" "unknown" or a P.O. Box; or (3) decedent names provided by community informants could be matched in the KCME database. After cases were identified as potentially homeless based on the above criteria, other documentation in the case records was reviewed to substantiate that the person was likely homeless at the time of his or her death; some cases were excluded at this stage if no such evidence was found. In addition, a separate group of cases identified as "formerly homeless" was created for decedents whose address matched a list of low-income permanent housing programs for people transitioning from homelessness.

Review Findings

All results must be considered with an understanding of the inherent limitations or bias that is associated with the exclusive use of KCME data. This includes the criteria by which cases fall under KCME jurisdiction for investigation[1], the limited and inconsistent data available from KCME case reports, and the sources of information available to the KCME for their investigations and reports. These limitations mean that one must be particularly cautious in interpreting the data and making comparisons to the general population. This is why throughout the study one will find qualifiers such as "the data *suggests* . . ." or "this *may* indicate . . ." rather than more definitive conclusions.

Demographics

Seventy-seven (77) homeless decedents were identified among the Medical Examiner Cases for 2003. The vast majority—83%—were men, and most were between 30 and 59 years of age. People of color, particularly Native Americans, African Americans, and people of Hispanic

[1] The King County Medical Examiner takes jurisdiction of deaths due to unnatural causes, deaths in which people die suddenly when in apparent good health and without an attending physician in the 36 hours preceding death, and deaths with suspicious, unknown, or obscure circumstances.

origin, were disproportionately represented relative to the general King County population. Native Americans (17%) were especially overrepresented. No Asians or Pacific Islanders were identified among the sample. The race and ethnicity findings are similar to those of Health Care for the Homeless Network (HCHN) 2003 Annual Report and of the Annual One Night Count of the Seattle-King County Coalition for the Homeless, except that the proportion of Native Americans in the homeless death review is higher than in either of these two data sets. A sample group of **43 formerly homeless cases** was identified in addition to the 77 homeless cases in this review. Their demographic characteristics were similar to those of the homeless decedents.

Circumstance and Cause of Death

Accidents of all types represented the most common **manner of death** among the 77 homeless people in the review (35%), followed by natural causes (29%). The most frequent specific **causes of death** for homeless people were acute intoxication (26%)[2], cardiovascular disease (17%), and homicide (9%). In addition, 6% of deaths were due to traffic accidents. Cardiovascular disease was the top cause of death among the formerly homeless sample (37%).

Fifty-five percent (55%) of homeless deaths reviewed occurred outdoors. Homeless people were three times more likely to die outdoors than those in the formerly homeless sample group. The majority of the homeless death incidents—63 of the 77—took place in Seattle. Twelve incidents occurred in south King County communities, one in east King County, and one was unknown. Deaths were relatively evenly split between summer and winter.

Associated Health Conditions

Data from KCME autopsy and investigation reports, as well as the primary and secondary causes of death were used to build a picture of the **overall health and burden of illness faced by this population** prior to death. Decedents included in the review each had an average of three health condition categories identified, with some having as many as eight different ones. Of the homeless decedents, 68% had either current use or history of alcohol/substance abuse, 53% had cardiovascular disease, 50% had a gastroinestinal condition, 32% had a pulmonary condition, 25% had a mental health condition, and 19% a neurological condition. Nearly all of the decedents who had some record of substance use or history were also concurrently coping with other health conditions. At least 19% of homeless decedents and 15% of formerly homeless decedents in this review had evidence of a co-occurring mental health condition with substance use or history of substance use.

Further Deliniation of Population

A larger sample of homeless decedents derived from the KCME cases would allow statistical testing for significance of findings. An alternative methodology using the HCHN database and the 2003 Washington State Death Certificate data when it becomes available may allow for a more accurate estimation of deaths among the homeless population. This initial study begins to shed light on the complexity of health issues experienced by King County's homeless population and raises many questions that further investigation could potentially answer.

[2] This includes intoxication due to alcohol, illegal drugs, prescription drugs, and combinations of these.

King County 2003 Homeless Death Review

I Introduction

The King County Council approved a proviso in its 2004 Public Health budget to authorize a one-year review of homeless deaths in King County, funded with Current Expense Funds. The Proviso states that:

> "…Of this appropriation, $20,000 shall be spent solely for a study of the mortality of homeless persons in King County. The department shall work in coordination with the King County Medical Examiner's Office, the Washington State Center for Health Statistics, Harborview Medical Center and any other appropriate organization to complete a study reviewing the nature and causes of death among the homeless population within King County. The department shall submit the final study report to the council upon completion. The final study report shall be filed with the clerk of the council for distribution to the lead staff of the law, justice and human services committee or its successor."

The advocacy of the community-based group Women in Black for a formal review of homeless deaths was also part of the precursor to this review process. Women in Black holds silent vigils whenever a homeless person dies outside in King County.

Health Care for the Homeless Network (HCHN), a program of Public Health - Seattle & King County, was charged to complete the review of homeless deaths. The multi-disciplinary health care provider network of HCHN provides health care services to homeless people at various sites throughout King County. HCHN also provides leadership to help change the conditions that deprive homeless people of home and health.

The time limitations and the financial limitations of the proviso were strict. The short timeline precluded the application of either of the more traditional epidemiological methods for approaching the question of mortality causality: case control and cohort studies. Both of these methods require substantially more time to develop interview tools, validate mortality data sources with respect to the specific population under study, and/or establish registries for further follow-up. One other possible other source of data, the 2003 Washington State Death Certificate data was not available at the time the study was conducted. Additionally, the funding ($20,000) precluded the use of more costly data sources such as the National Death Index or private databases such as Equifax. Therefore a cross-sectional description of mortality patterns from an immediately available source of death information on homeless people was used for this study. The King County Medical Examiner's (KCME) office offered a readily accessible and medically valid source of mortality information on individuals who die in King County.

The overall goal of this project was to develop a description of the number, causes, and characteristics of deaths among people who were identified as homeless in King County in 2003. The goal of this phase of the review is to identify and examine those cases which were under the jurisdiction of the KCME in 2003. The information derived from this study will help guide strategies for improving overall health and reducing the number of preventable and premature deaths among homeless people in King County.

In addition to including people who are currently homeless (living on the streets, in shelters, or in transitional housing), the study elected to include in its scope a sample group of individuals who had addresses in low-income permanent housing programs that specifically target people who were formerly homeless. These data were analyzed separately from data on individuals who met the criteria for the homeless category.

II Review of Literature on Deaths of Homeless People

Homeless mortality has been a subject of nine separate reports in the peer-reviewed literature. These studies were conducted in Sydney Australia, New York, Toronto, Philadelphia, Copenhagen, Montreal, Boston, Tel-Aviv, and Brighton UK between 1994 and 2004 (1-4, 6, 7, 13, 15-16). All of the studies utilized some established registry of homeless people and prospectively identified decedents. Each study compared the homeless death rate to the general population of the community. Standardized mortality rates were often calculated for homeless women, men, or youth in the respective cities for the given population of study. These studies consistently found mortality rates for homeless people to be significantly higher than the general population. The highest rates were found among the younger adults. Six studies also identified the associated health risks for deaths among homeless people. No trend could be identified because the health risks varied by the population and age group being studied (3,6,10,13, 15-16). A single study from Boston reported on health services utilization by homeless men prior to their deaths and found that 27% of the decedents had no health care services in the previous year (7).

Other types of reports, counts, or data collection on homeless mortality, not published in the peer-reviewed literature, have been conducted by numerous additional jurisdictions. The Centre for Research on Community Services of the University of Ottawa has several published reports on their website related to the deaths of homeless people (11,12). An informal survey by San Francisco's Health Care for the Homeless in 2002 showed that San Francisco, Portland Maine, Albuquerque, and Chicago have all conducted some form of homeless death analysis in the past. Of these, the most extensive work appears to have been done by San Francisco, which has tracked homeless deaths since the mid-1980s. Community advocates and journalists in San Francisco had pushed for a publicly funded homeless death prevention program and review ever since first conducting unofficial annual homeless death counts in 1985. In the late 1990s, the analysis was led by the San Francisco Department of Public Health. It was designed to document the number, characteristics, and cause of death among people who died homeless during the previous year. Like the review described in this report, the data source for their annual review was the case reports of the local County Medical Examiner (17).

While information from San Francisco can provide some insight into potential causes of mortality among Seattle's homeless, caution must be exercised in extrapolating data from the death reviews conducted by San Francisco or any other jurisdiction. The generalizability of the information derived from these reports is limited by the source of the information. Medical examiners in San Francisco, as in any city, will see only a select portion of the deaths in any population.

III Methods

The cases reviewed in this report were those of homeless people who died in 2003 in King County and were under the jurisdiction of the KCME. The KCME takes jurisdiction of deaths due to unnatural causes, deaths in which people die suddenly when in apparent good health and without an attending physician in the 36 hours preceding death, and deaths with suspicious, unknown, or obscure circumstances.

The KCME maintains a computerized database of information collected on each case. No single indicator for housing status or homeless status is included within the 2003 KCME case records. Several methods were applied to this database to identify decedents who were potential cases for the review. As no single list of "homeless individuals" exists to compare with this database, a multi-step approach was used to identify homeless decedents. Initially, all cases in the database with a residence address listed as "no permanent address," "unknown," or a PO box address were pulled for further review. The database was also searched by matching names from a list of homeless decedents provided by community informants and HCHN incident reports from HCHN providers. Finally, cases were pulled from the database if the incident or residence address matched one from a list of homeless shelters and transitional housing programs. A separate group of cases identified as "formerly homeless" was created for decedents whose address matched a list of low-income permanent housing programs for people transitioning from homelessness (Appendix 1). This list includes some programs that serve homeless people exclusively as well as others that have a certain number of units set aside for people who are homeless. Those cases identified from buildings with 50% of units or more for formerly homeless people were included as well as those who could be confirmed as formerly homeless by consulting with program managers.

After cases were identified based on the above criteria as potentially homeless or formerly homeless, the KCME narrative notes, autopsy reports, and other documentation in the case records were reviewed. Cases were excluded from further analysis if the decedent was identified as being from a jurisdiction other than King County or no information was contained in the file to substantiate that the person was likely homeless at the time of their death.

Data for this review came from a direct data transfer from the KCME database and a manual collection from KCME case investigation records and autopsy reports using a data collection tool (Appendix 2). Data were analyzed using Excel statistical tools and SPSS, and are presented using descriptive statistics.

IV Results

A. Review Population

Community informants, HCHN incident reports, and the original "no permanent address" list from the KCME provided a list of names of possible homeless and formerly homeless decedents, 91 of which were found within the 2003 KCME database. These, along with the cases whose residence address matched one of the shelter or housing programs, or was listed as "unknown" or as a PO box, produced a total of 148 potential cases for the review as summarized in Table 1.

Following the identification of potential cases in the KCME records, 77 cases met the inclusion criteria of likely homeless and dying in King County in 2003 and 43 cases met the criteria as likely formerly homeless and dying in King County in 2003. At this stage 28 cases were excluded from further analysis for reasons summarized below.

Table 1: Identification and Inclusion/Exclusion of Potential Cases

Method of identifying potential cases	**# of cases**
Single source for identifying case	
1) No Permanent Address (original list from KCME)*	30
2) No Permanent Address (identified during address matching process)	2
3) Shelter/Housing Address Match	41
4) PO Box Residence Address	11
5) Unknown Residence Address	3
6) Decedent Name from community informant or HCHN incident reports*	27
Multiple sources for identifying case	
1 & 6*	8
2 & 6*	2
3 & 6*	22
4 & 6*	1
1 & 3 & 6*	1
Total	**148**
Categorization/Exclusion of potential cases	**# of cases**
Included in Review Population – ***120 cases***	
Homeless decedents	77
Low income housed (formerly homeless) decedents - sample population	43
Excluded from Review Population – ***28 cases***	
Determined to be housed without reason to suspect former homelessness	16
Not from King County	8
Death did not occur in 2003	2
Fetal Death/Miscarriage to homeless mother	2
Total	**148**

** 149 names (including those from the original "no permanent address" list) were submitted to the KCME to be looked up in their database & assigned their corresponding KCME case numbers. Of these, 91 were found in the KCME database and 58 were not.*

B. Demographic Characteristics

Demographic data on the homeless review population and on the formerly homeless sample population are summarized in Table 2. The majority of homeless and formerly homeless decedents were men. In this review 81% of homeless deaths and 70% of formerly homeless deaths occurred between the ages of 30 and 59 years. Homeless and formerly homeless decedents in the KCME records were disproportionately African American and Native American relative to the general population. Hispanics as an ethnic group were also overrepresented in the review population as compared to general population. No Asians or Pacific Islanders were identified among the sample. Whites were underrepresented compared to the general population. The overrepresentation of African Americans, Native Americans, and ethnic Hispanics (regardless of race), and the underrepresentation of Whites, Asians, and Pacific Islanders as compared to the general population is consistent with the populations served by HCHN (5) and with the Annual One Night Count of people who are homeless in King County (18).

Table 2: Demographic Data

	Homeless Deaths 2003		Low Income Housed Formerly Homeless Deaths 2003 - sample	
	#	%	#	%
Total Deaths	77	100	43	100
Gender				
Females	13	17	9	21
Males	64	83	34	79
Race				
White	52	68	31	72
African American	8	10	6	14
Native American	13	17	4	9
Asian and Pacific Islander	0	0	0	0
Other/Unknown	4	5	2	5
Hispanic as Ethnicity	8	10	6	14
Age				
0-19	0	0	1	2
20-29	5	6	2	5
30-39	15	19	4	9
40-49	23	30	14	33
50-59	24	31	12	28
60-69	7	9	7	16
70-79	2	3	2	5
80-99	1	1	1	2
Average age at time of Death				
Females	46 years	(n=13)	44 years	(n=9)
Males	47 years	(n=64)	52 years	(n=34)
Total Pop	47 years	(n=77)	50 years	(n=43)

Living situations of the people in this review along with the cities in which the incidents took place are summarized in Table 3. The majority of incidents took place in Seattle, affecting homeless people from a wide range of living situations.

Table 3: Living Situation and Incident City for Homeless Decedents

Living Situation	#
Outdoors	25
Emergency Shelter	14
Transitional Shelter	9
Motel (most 1 night, none longer than a week)	7
Vehicle	5
Doubled up with other people	3
Unknown	14
Total	77

Incident City	#
Seattle	63
Federal Way	3
Renton	2
SeaTac	2
Auburn	1
Des Moines	1
Maple Valley	1
Redmond	1
Tacoma	1
Tukwila	1
Unknown	1
Total	77

The data on the military background of the decedents in the review were incomplete. At minimum, however, 16 of the homeless decedents and nine of those in the formerly homeless sample population were veterans. United States citizenship was documented for all but three homeless cases in which data were not available. Of the formerly homeless sample population one had Mexican citizenship and the rest had United States citizenship. Data were generally not available on whether or not the people included in the review had dependent children or were among the single adult population.

Among the 77 homeless decedents in the study population, 32 (42%) had been seen by a HCHN provider at least one time since January 1st, 2001. Of the formerly homeless group, 19 (44%) had been seen by a HCHN provider at least once during the same time period.

C. Circumstances at Death

Accidents of all types represented the most common manner of death in both the homeless and formerly homeless populations (Table 4). Intoxication due to alcohol, street drugs, prescription drugs, or a combination was the most frequent cause among the accidental deaths. While intoxication may be intentional or unintentional, if there was no evidence substantiating an intentional act of suicide by intoxication this determination could not be made by the KCME and such deaths were categorized as either accidental or undetermined depending on the circumstances. The next most common manner of death for homeless and formerly homeless decedents in the review population was natural. Natural deaths are those for which a physical cause can be identified that does not include an accident, suicide, or homicide. Map 1 illustrates the incident location by manner of death for homeless decedents of the review population. No pattern in the manner of death and incident location could be discerned from this map.

Health Care for the Homeless had provided health services at least once since January 1, 2001 for up to half of the homeless decedents in each manner of death category. Incident locations in Map 2 illustrate that many of those who had not received services from a HCHN provider were in south King County or north along the Aurora corridor. Those who had been seen by a HCHN provider tended to be clustered around the downtown core where most services for single homeless adults are available.

Table 4: Circumstances of Death

	Homeless (n=77)		Low Income Housed Formerly Homeless (n=43)	
	#	%	#	%
Manner of Death				
Accident (total)	27	35	13	30
- Intoxication	*18*	*23*	*11*	*26*
- Other	*9*	*12*	*2*	*5*
Natural	22	29	15	35
Undetermined	8	10	2	5
Homicide	7	9	1	2
Suicide	2	3	3	7
No information	11	14	9	21
Location of Death*				
Outdoor Death	42	55	7	16
Indoor Death (Indoor in Hospital)	34 (10)	44 (13)	33 (5)	77 (12)
No information	1	1	3	7
Season				
Summer (April-September)	39	51	24	56
Winter (October-March)	38	49	19	44

** **Indoor** death includes: in residence, shelter, motel, hospital (if >24hrs)*
***Outdoor** death includes: in vehicle, on streets, transient encampment, restrooms of restaurants/grocery stores, hospital (if <24 hrs and incident was outdoors)*

Of the review population, homeless people were three times more likely to die outdoors than their counterparts in the formerly homeless sample group. Incident Locations and Circumstances shown in Map 3 illustrate that for homeless individuals nearly all the deaths in south King County and the majority of those in the central downtown core occurred outdoors. Even though the proportion of formerly homeless decedents who died inside was nearly twice that of the homeless decedents, their rates of death in the hospital were nearly equal.

No temporal associations such as time of day, day of the week, or day of the month could be identified for either the homeless or formerly homeless decedents among the KCME cases. However, the time of year data did illustrate that slightly more deaths occurred among both the homeless and formerly homeless populations in this review during the summer season.

D. Cause of Death

The causes of death (by category) for homeless and formerly homeless decedents in this review are detailed in Table 5. The most frequent cause of death was acute intoxication (26%), which includes intoxication due to alcohol, prescription drugs, street drugs, or a combination of these. This was followed by cardiovascular disease (17%) and homicide (9%). Also notable was that 6% died due to pedestrian and other traffic accidents, and 5% were discovered so long after their death that cause of death could not be determined due to decomposition. Of those with cirrhosis as the cause of death, information from the case records may not have indicated whether the condition was related to alcohol or IV drug use, infection, or other health conditions. Among the formerly homeless sample group cardiovascular disease surpassed acute intoxication as the number one cause of death (37%).

Table 5: Primary Cause of Death

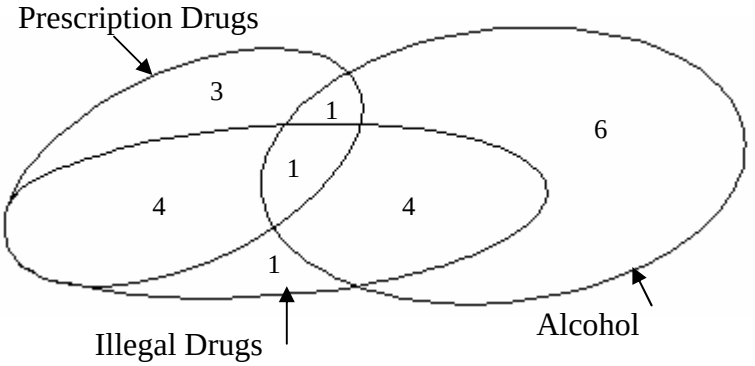
	Homeless (n=77)		Low Income Housed Formerly Homeless (n=43)	
Cause of Death (category)*	**#**	**%**	**#**	**%**
Acute intoxication**	20	26	13	30
Cardiovascular Disease	13	17	16	37
Homicide	7	9	1	2
Cirrhosis	5	6	2	5
Infection or condition secondary to ETOH or IV drug use	5	6	3	7
Trauma – Traffic (pedestrian)	5 (4)	6 (5)	2	5
Trauma – Non Traffic	4	5	1	2
Cancer	2	3	0	0
Drowning	2	3	1	2
AIDS	1	1	0	0
Burned in Fire	1	1	0	0
Choking	1	1	0	0
Diabetes	1	1	0	0
Pneumonia	1	1	0	0
Tuberculosis	1	1	0	0
Chronic Obstructive Pulmonary Disease (COPD)	0	0	1	2
Unknown – Decomposition	4	5	1	2
Other	4	5	2	5

* *Suicides are reflected under manner of death (table 3) and in this table are distributed under other categories based on the cause of death.*

** *Includes acute intoxication due to alcohol, prescription drugs, street drugs, or a combination of these.*

Figure 1 shows a breakdown summarizing all of the types of drugs involved in the 20 homeless deaths identified in this review in which the primary cause of death was acute intoxication.

Figure 1: Drugs Involved in Homeless Acute Intoxication Deaths



Any Prescription Drugs	9 cases
Any Alcohol	12 cases
Any Illegal Drugs	10 cases
Total Homeless Acute Intoxication Deaths:	20 cases

(figure is not to exact scale)

E. Health Conditions

Data from KCME autopsy and investigation reports, as well as the primary and secondary causes of death were grouped into categories and were utilized to build a picture of the overall health and burden of illness faced by this population prior to death. Although each decedent may have had multiple health problems within a single category, each category was listed a maximum of once for each decedent. Therefore, the number of cases listed in Table 6 under each category reflects the number of unduplicated decedents with each type of illness. Not included are those health conditions that could not be identified on autopsy or those for which no suggestion was made in the KCME records.

Decedents included in the review each had an average of three health condition categories identified, with some having as many as eight different ones. Based on information from the KCME autopsy and investigation records, the relative frequency of many of the health condition categories was similar for both the decedents who were homeless and those who were formerly homeless. The KCME autopsy and investigation records of homeless decedents reported a higher proportion of tuberculosis, cancer, neurologic, renal, and skin conditions whereas the records of formerly homeless decedents documented a higher proportion of diabetes. Nearly all the records of decedents that indicated substance use or history of it also indicated other health conditions. This was true for those records indicating a mental health condition as well. The KCME records indicated that at least 19% of homeless decedents and 15% of formerly homeless decedents had evidence of a co-occurring mental health condition with substance use or history of substance use.

Body Mass Index (BMI) was calculated for the decedents based on the measurements supplied in the autopsy reports. Nearly 50% of homeless decedents fell within the overweight or obese category and only one person was underweight. The BMI cannot be strictly interpreted because an individual's weight may fluctuate based on their hydration status, and for reasons of illness such as the retention of fluid in the abdomen (ascites) related to cirrhosis, renal failure, congestive heart failure, or dehydration as examples. An individual's BMI may change from one weight category to another when these conditions are present. A more complex assessment process would be necessary to tease out sufficient information to make any judgment about a decedent's weight status. However, the association of overweight and obesity with chronic health conditions such as heart disease and diabetes which are prevalent in the review populations may suggest the need to assess this issue further. Additionally, weight and obesity are areas of focus for Public Health in the coming year.

Table 6: Frequency of Health Conditions

	Homeless		Low Income Housed Formerly Homeless	
	#	%*	#	%*
Health Condition (category)**				
Current use or History of alcohol/substance use	46	68	23	56
Cardiovascular Disease	36	53	24	59
Gastrointestinal Condition	34	50	15	37
Pulmonary Condition	22	32	12	29
Mental Health Condition	17	25	9	22
Neurologic Condition	13	19	3	7
Renal Condition	10	15	3	7
Infection	7	10	6	15
Skin Condition	6	9	1	2
Trauma	6	9	4	10
Cancer	5	7	0	0
Tuberculosis	4	6	1	2
Diabetes	3	4	8	20
Musculoskeletal Condition	2	3	3	7
Cardiac Arrest	1	1	2	5
Endocrine Condition	1	1	0	0
Nosocomial Event (hospital infection)	1	1	0	0
Nutrition-related Condition	1	1	1	2
Other Health Condition	9	13	5	12
Unknown (no medical information available)	9	--	2	--
Co-occurrence of Health Issues				
Substance use/history with any condition	41	60	23	56
Mental Health with any condition	15	22	8	20
Mental Health with Substance use/history	13	19	6	15

* *All percentages exclude cases with no known medical information "Unknown" Homeless n=68 (of 77). Formerly homeless n=41 (of 43).*

** *Source: 2003 King County Medical Examiner's investigation and autopsy reports.*

V Interpretation

The results of this review generate as many questions as they answer. The review does provide guidance in terms of where to direct further investigation, and suggests areas in which to direct health care efforts in the community. However, all information must be considered with the greatest caution in generalizing the results of the review due to the inherent bias (the bias being that not *all* deaths come under the jurisdiction of the KCME) associated with drawing cases exclusively from the KCME's data.

A. Representativeness of Review Sample

There is no complete and precise count of homeless people in King County nor a comprehensive breakdown of their demographic characteristics. The dependence of this review on Medical Examiner's records as the sole data source severely limits the extrapolation of the findings, and may result in inaccurate representation of the deaths among all homeless people. Not all deaths occurring among homeless people or formerly homeless people are under the jurisdiction of the Medical Examiner. Any decedents who had chronic health conditions whose deaths did not appear suspicious or obscure would not have fallen under the KCME jurisdiction. Similarly, homeless individuals under the care of a health care provider who died of diagnosable causes would not likely be identified for KCME investigation. As a result, such decedents would not have been represented in the review sample. This may be an explanation for why 58 of the 149 names of decedents provided by community informants and HCHN incident reports were not found in the KCME database. Conversely, homeless deaths are often more likely to fall under KCME jurisdiction than the general population because people who are homeless often die or are found dead in situations that are suspicious or unsecured.

The formerly homeless group is a convenience sample and is not representative of the entire population in low-income permanent housing who have been recently homeless. It was compiled using a specific list of buildings, with no consistent information available on the length of time each person had actually been housed. Often when a homeless person becomes seriously or terminally ill with a chronic condition they become eligible for a wider variety of programs and housing services and may be lost to the HCHN and other homeless data collection systems prior to their death. Thus, it is not possible to identify all people who have been recently or formerly homeless. One impact of using this small incomplete sample based only on KCME data to represent the formerly homeless population is that deaths due to chronic disease may be underrepresented.

B. Sample Size and Analysis

The small sample size of this review limited the statistical analysis that could be done. Frequencies and proportions could be tabulated but statistical significance could not be calculated using such small numbers. However, given the population and this preliminary data, the population size required to perform such tests could be calculated and a recommendation about the study period necessary to achieve an adequate sample size could be estimated.

Another limiting factor to the data analysis of this review was the lack of a valid comparison with the non-homeless population of King County. Because the KCME data does not reflect all

deaths in King County and because the homeless population in this review does not reflect all homeless deaths in King County this comparison was not possible. It was also not valid to compare the homeless deaths in this review with the total KCME population because of the number of cases that are brought in from other counties to the trauma center at Harborview or for other reasons which then end up in the KCME data. Finally, the lack of a complete and precise count of homeless people in King County precluded having a valid denominator with which to calculate homeless mortality rates.

C. Impact of Data Source

The data supplied in the KCME records is generated based on the needs of each investigation, and varies according to the situation and availability of informants. As a result, not all data fields are available for all cases, and supplemental narrative notes are available in some cases but not others. As an example, the complete medical history of the decedents may not have been available or necessary to every investigation, and therefore may not have been fully reported in the KCME narrative notes. Many homeless people may not have had consistent medical care nor records that would be available for the KCME to access. People who are homeless frequently have fewer contacts who can serve as informants and provide medical history information at the time of death. Thus, the data on medical conditions in this review may be an underrepresentation of the true burden of illness. Conversely, medical conditions such as atherosclerosis and heart disease, which may not have presented any signs and symptoms and would otherwise have gone unrecognized by the individual, could have been identified during autopsy. This may have caused such conditions to be represented in this review in higher proportions than would normally be identified in the general living population. The extent to which these data provide or do not provide a representative picture of the burden of illness is not known.

Available information was also inconsistent in terms of other health issues such as dental health/problems and tobacco use, so these areas have not been commented on within the scope of this review. A complete health picture cannot be generated from KCME data alone. As a result, the data set is not comprehensive and should be used with an awareness of its limitations.

D. Demographic Characteristics

The review population generally mirrors the racial characteristics of the clients served by HCHN providers. However, deaths among homeless Native Americans occurred in higher proportion (17%) than the proportion of Native Americans served by HCHN (8%) or the proportion of Native Americans identified in the 2003 One Night Count (3%).

The review population does not reflect the same age or gender distribution as the HCHN client population. Individuals 0-19 years of age are underrepresented in this review population. The mortality study by Roy et al of street youth 14-25 years old in Montreal found a standardized mortality rate of 921/100,000, which suggests that the methods used in this review may have been insufficient in identifying homeless youth (16). A possible explanation could be that homeless unattached youth who die initially without an address may eventually be reported under a parent or family member’s address as the result of the KCME investigation. For young children, many deaths would most likely have occurred in hospital and those too could have been overlooked by the case identification process of this review.

Gender differences are not as extreme in the population served by HCHN as they are in the homeless decedent population of this review. For instance, men represent 57% of the entire HCHN client population whereas they represent 83% of the decedents in this review. The last San Francisco death review found similar results. Using standardized mortality rates, Cheung & Hwang found mortality rates among young homeless women to be similar to that of young homeless men using a shelter registry as the source of cases (4). The frequency of male death as compared to female death in the review population may reflect the likelihood that circumstances of male deaths more frequently result in KCME investigation than do those of female deaths.

E. Causes of Death

A large proportion of deaths in this review resulted from natural causes, accidental intoxication, and homicide, as did those in the San Francisco review. Due to the mandate of the KCME, the number of homeless people dying of natural causes and chronic illness are likely underrepresented because many may have been under the care of a health care provider and an investigation by the KCME would not have been required. Conversely, the KCME investigates all accidental, acute intoxication, and violent deaths so the data in this review are not underrepresentative of these types of deaths although the proportions may not be representative relative to the general population because of the possible underrepresentation of homeless deaths due to chronic disease.

There were seven homicides of homeless people identified in this review, while in King County there were a total of 77 homicides reported in 2003 (14). With respect to pedestrian traffic accidents, four of the 39 reported by the Medical Examiner in 2003 involved homeless people identified in this review (14). Homeless people thus appear to be overrepresented among homicide and pedestrian traffic deaths in King County, however the exact extent of this overrepresentation cannot be determined due to the lack of a complete and precise count of the number of homeless people in King County. These factors suggest the need to look more closely at safety issues facing homeless people living outdoors.

The high proportion of acute intoxication deaths and substance use among homeless people suggests the need to assess the adequacy and accessibility of treatment programs and services for homeless and low income populations. Also notable for further evaluation is the number of deaths of homeless people who had been staying in a motel for less than a week, often only one night.

F. Health Conditions

People who are homeless in King County are similar to homeless people across the US in that they face a multitude of interconnected and often chronic health conditions and an overall burden of illness which is often far greater than that of the population at large (5). The review data illustrate that while someone experiencing homelessness may die of acute intoxication, an accident, or homicide, they may well have also suffered from cardiovascular disease, obesity, gastrointestinal disorders, pulmonary conditions, mental illness, or other health conditions.

Based on our sample population, homeless people who become housed may continue to experience significant health issues and are at risk for premature death similar to their currently homeless counterparts. In the review population, the average age at death was not significantly

higher for formerly homeless people than for currently homeless people, and for women in the formerly homeless sample group it was lower. While poor health may be linked to homelessness or former homelessness it is also possible for the impacts and consequences of poor health to lead a person to become homeless. While causality in each case could not be determined from this review, these factors do suggest a need for continuity of healthcare and supportive services in low income permanent housing.

Even among the acute intoxication deaths summarized in this review, the burden of other illnesses faced by these decedents was significant. Of the 20 homeless people who died of acute intoxication, at least 11 had cardiovascular disease, 11 had gastrointestinal disorders, 8 had pulmonary conditions, 6 experienced mental illness, and many had a range of other health conditions. In total these 20 people were coping with an average of four separate health condition categories each. The burden of illness was not significantly different for the 13 individuals in the formerly homeless sample population who died of acute intoxication. These subpopulations were found to have a greater overall burden of illness than the total homeless population in this review. The exact causal relationship between subtance use and poor health cannot be determined by the data in this review. However, it is known that substance use can lead to certain physical health conditions. The results also raise a question about whether an association exists between self-medicating (for pain or otherwise) with drugs or alcohol and a lack of access to adequate affordable healthcare. In addition, it is possible that homeless people may face increased risk of depression or other mental illness as a result of the heavy burden of illness with which they cope daily.

G. Co-occurrence of Mental Illness and Substance Use

A further illustration of the extent of co-occurrence of health conditions among homeless and formerly homeless people can be seen by looking at mental health and substance use/history. For example, 89% of homeless decedents with current use or history of alcohol/substance use were also concurrently coping with at least one other major category of health conditions. A minimum of 28% of them were specifically dealing with mental health issues along with their current or past substance use. Among all homeless decedents with documented mental illness, 76% had co-occurrence of current or past substance use, and 88% were coping with at least one other major category of health conditions in addition to mental illness.

The full extent of co-occurrence of mental illness with other conditions cannot be determined in this review, since mental health was not consistently reported in the KCME data and notes. The above data include only those 17 homeless and 9 formerly homeless cases for whom there was documentation of mental illness in the KCME data. If this were expanded to include those for whom mental illness was suggested by friends or family in the KCME reports it would increase to 20 homeless and 12 formerly homeless cases. In addition, homeless and formerly homeless decedents may have lacked documentation of mental illness because they lacked access to care, and they may have been less likely to have friends or family who could attest to their condition informally to KCME investigators. However, even without complete information on the true extent of mental illness in the population, the data in this review do at least hint at the impact of mental illness on a homeless person's overall health. They also suggest some of the complications that may be involved when trying to provide primary health care to people whose mental health may interfere with their ability to engage with providers and accept or comply with

treatment. In this way, mental health services could be seen as part of the continuum of primary health care services for this population.

H. Areas for Further Investigation

Future investigation into the number and causes of homeless mortality in King County could examine the Washington state death certificate data once it is finalized and released in late 2004. Among the list of 149 decedent names identified by community informants, HCHN incident reports, and the original "no permanent address" list from the ME, 58 could not be matched with KCME cases. These and other potential homeless deaths not available for inclusion within the scope of this review could possibly be captured by attempting to match the state deaths certificate records, once they become available in late 2004, with the Health Care for the Homeless encounter database for a fuller picture of the scope of death among homeless people in King County in 2003.

VI Conclusions

This review of homeless deaths among 2003 KCME cases suggests that:

- Decedents tend to be younger adults, people of color, and male. Native Americans (17%) were especially overrepresented.
- Characteristics of the formerly homeless decedents in the sample group identified in this review are similar to those of the homeless decedents.
- Fifty-five percent (55%) of homeless deaths reviewed occurred outdoors, and 82% of the incidents occurred in Seattle.
- The manners of death of homeless people were distributed in all the categories reported by the Medical Examiner with natural causes and accidental intoxication being the most frequently cited.
- Acute intoxication and cardiovascular disease and were the most frequent causes of death.
- Homeless people appear to be overrepresented among homicide and pedestrian traffic deaths in King County, but the exact extent of this overrepresentation cannot be determined.
- Decedents suffered from an average of three categories of health conditions that could be identified in their KCME case records, with some having as many as eight different categories.
- Many cautions must be exercised in the extrapolation of the findings of the review.
- A larger sample of homeless decedents derived from KCME cases would allow statistical testing for significance of findings. An alternative methodology using the HCHN database and the 2003 Washington State Death Certificate data once it becomes available may allow for a more accurate estimation of deaths among the homeless population.

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Map 1:
Manner of Death

Map 2:
Decedents Receiving HCHN Services in the Last Three Years

Map 3:
Incident Locations
and Circumstances

Appendix 1: List of Selected Permanent Housing Programs Reviewed

Program/Building *

AHA/LIHI Broadway House
AHA Dorothy Day House
AHA Frye Apartments
AHA Josephinum
AHA Renton Family Housing - Highland Court
AHA Renton Family Housing - Tucker Apartments
AHA Spruce Park Apartments
AHA The Westlake
AHA Traugott Terrace
AHA Wintonia
AIDS Housing of Washington - Bailey Boushay
AIDS Housing of Washington - Shirley Bridge Bungalows
Compass Center Magnolia House
DESC Lyon
DESC Morrison
DESC Union Hotel
LIHI Arion Court Apartments
LIHI Glen Hotel Apartments
LIHI Greenwood House
Multi-Service Center (Federal Way & Kent) - Maple Lane Court & Estates
Multi-Service Center (Federal Way & Kent) - Mansard Estates
Multi-Service Center (Federal Way & Kent) - Mitchell Place Apartments
Multi-Service Center (Federal Way & Kent) - White River Estates (formerly Tall Cedars)
Multi-Service Center (Federal Way & Kent) - Victoria Place II
Operation Nightwatch Senior Housing
PHG Colwell
PHG Gatewood
PHG Haddon Hall
PHG Lewiston
PHG Pacific Hotel
PHG Plymouth Place
PHG Ponderosa Apartments
PHG Scargo
PHG St Charles
PHG St Regis
PHG William Tell
Pioneer Human Services Permanent Economy Housing - Angletree Apartments
Pioneer Human Services Permanent Economy Housing - Granberg Apartments
Pioneer Human Services Permanent Economy Housing - Lennox Apartments
Pioneer Human Services Permanent Economy Housing - St Regis Hotel
Pioneer Human Services Family Housing - Lloyd Snider Apartments
Pioneer Human Services Family Housing - Walker House
YWCA Downtown
YWCA Lexicon-Concord Apartments
YWCA Opportunity Place

** In cases where the building does not exclusively serve formerly homeless people, any cases matched to the address were pulled as potential cases and final determination on inclusion in the study was made after the data collection phase.*

Appendix 2: Data Collection Tool

ME Case #: 03-____

Name: **Age at Death:** **Sex:**
Alias/Nickname: **Race/Hispanic:**
Source of name: **Date of Birth:**
Study Category: Homeless / Formerly Homeless **Include in study:** **Y / N**

Living situation/Homeless Status: (no permanent address/ shelter/transitional/SRO/doubled up...)	
Residence street address and census tract:	
Length of time (housed/motel/transitional)	

Unemployed/Retired:	**Citizenship:**
Occupation when employed/Type of business/Death on Job:	**Veteran/Branch:**

Incident day, date, and time:	
Incident address and census tract:	
Location/Type of location:	
Medical conditions/history	1) 2) 3) 4)

Medical Info: ❑ Hospital Death ❑ Recent Hospitalization/Treatment	**Toxicology information:** ❑ Ethanol (EtOH) >0.08 ❑ Narcotics (Legal & Illegal) ❑ Other Medications/Substances

Day, date, and time of death:		
Place of death & census tract:		
Location/Type of location:		❑ **Indoor /** ❑ **Outdoor Death**
Hospital:		

Manner of Death: ❑ Natural ❑ Suicide ❑ Accident ❑ Undetermined ❑ Homicide ❑ Pending	**Primary Cause:** **Secondary Causes:** Layman Terms: Suicide Declaration (Y/N):

History/Background: ❑ History of Mental Illness ❑ Suggestion ❑ Documented ❑ History of alcoholism/alcohol use ❑ History of drug use	**Circumstances of Death/Narrative Notes:**
Possessions: ❑ Possession of drug kit items ❑ Possession of prescription medication ❑ Psychotropic (anti-dep) ❑ Other ❑ Medic alert	

Other narrative notes: (incl. sources)